

Application No.: 09/316549

Docket No.: PAS-093

REMARKS

Upon entry of this paper, claims 1-14, 16-19 and 21-31 are pending.

Summary of the Claimed Invention

The present invention addresses the limitations of conventional CAD (Computer Aided Design) systems by integrating analyses into the models of products. In particular, the present invention captures an analysis (such as an engineering analysis) inside a feature to generate reproducible referenceable parameters and/or geometric entities that describe the results of the analysis. An analysis is represented as a feature that is part of a model of a product. Because the analysis is integrated into the feature-based model, when a change in the model that requires updating of the analysis occurs, the analysis is automatically updated and the associated feature is updated. A new type of feature is defined to represent the analysis. This feature serves as a placeholder for the analysis.

Summary of Claim Amendments

Applicants have amended claims 7, 9, 14, 18-19, 23, 27, 31 to specify that the analysis is integrated into a feature of the model.

Claim Rejections Pursuant to 35 U.S.C. §112, Paragraph 1

Pending Claims 1-14, 16-19 and 21-31 were rejected under 35 U.S.C. §112, Paragraph 1, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to make and/or use the invention. These rejections are respectfully traversed in view of the amendments above and the following comments.

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The Examiner rejected claims 1-14, 16-19 and 21-31 as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains...to make and/or use the invention. The Examiner sets up a circular argument by first stating an incorrect belief that Applicant has incorrectly attempted to incorporate by reference the software application Pro/Engineer 2000i by referring to that software application in lines 11-13 of the specification (see paragraph 3 of the Office Action). The Examiner then proceeds to argue that because Pro/Engineer is not incorporated, the remainder of the specification does not provide an adequate description of the claimed invention. Applicants further note that in the section of the Office Action responding to the Applicants arguments, the Examiner admits that the Applicant did not attempt to incorporate Pro/Engineer 2000i which strongly suggests that the only purpose of the Examiner's statement in paragraph 3 stating the opposite conclusion was to set up a straw man for the Examiner to knock down. Applicants respectfully submit that they did not attempt to incorporate Pro/Engineer 2000i (which Applicants note in passing does not appear to be eligible for incorporation in any case) and that the description in the specification is enabling to one skilled in the art as discussed in more detail below.

The applicable standard by which to judge the sufficiency of a specification is set forth in the MPEP. Applicant notes that the standard of the written description, in accordance with 35 U.S.C. §112, is that the written description of the invention shall be such that a person skilled in the art may be able to make and use the invention. "Detailed procedures for making and using the invention may not be necessary if the description of the invention itself is sufficient to permit those skilled in the art to make and use the invention. ..." § 2164 Manual of Patent Examining Procedure, 8th Edition, Revision 1, Feb. 2003. The analysis required to determine whether the enablement requirement has been met focuses on whether the features are described in the specification so as to enable **one skilled in the art** ... to make or use the invention, without undue experimentation. It is respectfully suggested that each of the features questioned by the Examiner would be understood by one skilled in the art. The Examiner suggests that because the Examiner is confused about the mechanisms by which a CAD system works, a practitioner in the applicable field would also be confused. Applicants respectfully differ and note that the Examiner's state of mind is not the applicable standard and is not dispositive of the matter.

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As Applicants pointed out in their previous response, the present invention focuses on integrating an analysis into a feature-based model, but the underlying process of analyzing data per se is well understood in the art. Accordingly, Applicants have focused their discussion in the specification on the integration assuming the reading audience is familiar with the mechanics of a CAD system. Taking into account the fact that one reasonably skilled in the art would understand the CAD environment in which the integration of the analysis into a feature of the model step takes place, the integration step is described in sufficient detail to enable one skilled in the art to practice the invention. For a specific feature by feature discussion of the elements in the specification, the Examiner is directed to Applicants previous response in this matter. For additional evidence that the supporting structures and mechanics of the CAD environment other than those involving the integration of the analysis were understood by those reasonably skilled in the art, the Examiner's attention is directed to the IDS materials submitted by applicant as well as the references cited by the Examiner. Applicants also point out the language cited by the Examiner at page 5 of the Office Action supports Applicants contention: "The subject matter of the claim need not be described literally (i.e. using the same terms or in haec verba) in order for the disclosure to satisfy the description requirement". Applicants also note that while the Examiner argues that the supporting CAD structures and mechanisms are not sufficiently described to enable one skilled in the art to make and/or use the invention in the paragraph 112 rejection, part of the rejections put forth by the Examiner pursuant to 35 U.S.C. § 102 were based on the idea that all of the supporting structures were well understood. The Examiner's two positions are logically inconsistent. The claimed features of the invention are sufficiently described when considered in combination with the knowledge of the skilled practitioner relating to the surrounding CAD mechanisms.

Pending Claims 1-14, 16-19 and 21-31 were also rejected under 35 U.S.C. § 112, Paragraph 1, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that Applicants had possession of the claimed invention at the time the application was filed. These rejections are respectfully traversed in view of the amendments above and the following comments.

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As Applicants pointed out previously, the invention as claimed may be practiced in a major commercial product Pro/Engineer 2000i released by the date of application. Clearly the Applicants had possession of the invention. The Examiner states that "the issue pertains to the integration of some unknown analysis feature into some unknown CAD program"(see paragraph 44 of the Office Action). The Examiner's statement is incorrect for two reasons. First the type and function of the analysis feature is amply described in the specification, see for example, page 1, line 30, an engineering analysis, page 4, line 20, an analysis identifying the center of gravity of an object, page 4, lines 24-27, engineering analysis or other type of analysis, page 5, lines 5-7 encapsulation of analysis allows CAD to determine whether input parameters satisfy engineering requirements, page 7, line 1, analysis is directly integrated into the feature-based model, page 7, lines 9-11 feature that contains an analysis is automatically updated by re-computing the analysis when the model changes, etc.. Secondly, Pro/Engineer 2000i was explicitly listed in the specification as a representative CAD program in which the present invention could be practiced. Since it was listed, and was extremely well known by those skilled in the art, it can hardly be said to be unknown.

Applicants also wish to address the Examiner's request for source code in paragraph 9 of the Office Action. The request is unnecessary as Applicants clearly had possession of the claimed invention at the time of filing. Additionally, the Applicants are not required to file source code for a major commercial product with the Patent Office where it will be open to public inspection. Such a requirement would be an open invitation to the theft of Applicants product and will have a chilling effect on the prosecution of software patents. If the Examiner wishes to maintain this request, Applicants request a telephone conference to discuss this matter between the undersigned, the Examiner and his Supervisor.

The Examiner's discussion of incorporation by reference in paragraphs 12-13, is not applicable since a) Applicants did not attempt to incorporate by reference, and b) the Examiner admits that the Applicants did not attempt to incorporate by reference.

Claim Rejections Pursuant to 35 U.S.C. §112, Paragraph 2

Pending Claims 7 and 18 were rejected under 35 U.S.C. §112, Paragraph 2, as being indefinite in that it fails to point out what is included or excluded by the claim language.

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Applicants have amended claims 7 and 18 to more particularly point out that the analysis is performed by an external program to the CAD system/package prior to the analysis being incorporated as a feature in the model.

Double Patenting Rejections

The Examiner provisionally rejected claims 1, 7, 14, 18, 19, 23, 27 and 30-31 under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 1, 8 and 24 of co-pending Application No. 09/318, 105. Applicants assert the claims are patentably distinct as the claims of each of the two applications include unique limitations not present in the other application. Accordingly, Applicants decline to execute a terminal disclaimer at this time.

Claim Rejections Pursuant to 35 U.S.C. §102(b)

The Examiner rejected claims 1-14, 16-19 and 21-31 pursuant to 35. U.S.C. 102(b) as being anticipated by Sebastian (U.S. Patent No. 5,552, 995), Rabemanantsoa, Kaylan-Seshu et al., and Pro/Engineer Release 19. The Applicants respectfully traverse each of these rejections for the reasons stated below.

Summary of Sebastian

Sebastian describes a CAD system which attempts to concurrently design parts, tools for making a part and the processes used to make the part. Parts are made from a number of sub-parts and a product is designed from a combination of parts. A material selector module is used to determine a list of material properties and associated threshold values that are critical for success in the design of the product. The core design module takes into account functional specifications as well as part geometry. Pro/Engineer is used in one of the disclosed embodiments. Sebastian does not teach the integration of an analysis as a feature into a feature-based CAD system.

As set forth in MPEP § 2131, "[a] claim is anticipated [under 102(b)] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." The Applicants respectfully submit that, under this standard, none of the references describe every element of the independent claims, and therefore they do not

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disclose all of the elements of the independent claims and the claims which are dependent thereon. The Examiner is required to point with specificity to the portions of the reference the Examiner is relying on. The general recitation of col. 1 to col. 8 in Sebastian does not indicate with sufficient specificity the language the Examiner is relying upon for support for the claim rejections. The Examiner also cited Figure 6 in Sebastian which is discussed in the specification at col. 18, lines 17-62 and discusses a representation system 76a which includes an external interface 36b to a CAD system. The cited section further notes that Pro/Engineer may be used as the rendering engine 104 and that Pro/Engineer may be the CAD system that is accessed via the external interface. There is no discussion of integrating any analysis performed by the representation system 76a as a feature of the model. Figure 7 in Sebastian is also cited by the Examiner and is discussed in the specification at col 20, lines 61-67 and discusses a system architecture diagram for an injection molding plastics system. Lines 61-67 discuss the ability of the core design module to interface with an external CAD program such as Pro/Engineer. The Figure 7 description also does not disclose the integration of an analysis into a feature of the model. Sebastian discusses a calculation engine 118 that generates parametric values for newly instantiated or modified features by evaluating a set of engineering calculations and further indicates that the features may be subject to constraints. One of the constraints listed (at col. 20, line 61) is an external constraint which dictates procedures based on external analysis results. In other words, a procedure is called based on the externally performed analysis. While the analysis result is discussed as impacting the feature, there is no discussion of the analysis and/or its results being integrated into the feature. The remaining sections of Sebastian cited by the Examiner also fail to disclose the integration limitation. Accordingly, since all of Applicants remaining independent claims require a form of integration of the analysis and/or its results into a feature in the model, Applicants request the withdrawal of the 35 U.S.C. 102(b) rejection based on Sebastian.

Summary of Rabemanantsoa

Rabemanantsoa is an article discussing the coupling of Artificial Intelligence with an object-oriented database in a CAD/CAM environment. Pro/Engineer is used to model the products and parts being designed. An object-oriented database is used to model data and handle logic based reasoning of graph representation. A system is disclosed which integrates automated

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feature recognition plus position and orientation needed for part mating. The external database is used in planning and manufacturing assembly tasks. The system relies on an artificial intelligence module external to the CAD/CAM system. The cited section 3.1 simply does not discuss the integration of performed analyses into a feature of the model. The integration of the analysis into a feature of the model of an object limitation that is present in each of Applicants claims is not present in Rabemanantsoa.

Furthermore, Applicants also wish to take issue with the Examiner's statement that Applicants have failed to address the specifics of the rejection (see paragraph 53). Other than a summary of Rabemanantsoa, a general reference to the entirety of section 3.1, and a concatenated recitation of the various limitations found in Applicants claims(see paragraph 54), the Examiner has provided no specific rejections. The Examiner has failed to indicate how he feels each element of Applicants independent claims are disclosed within Rabemanantsoa. Applicants will be happy to respond to a detailed limitation by limitation rejection but can not respond to a generalized rejection. There is clearly no discussion of the integration of the analysis/results of the analysis into a model feature as claimed by Applicants disclosed in Rabemanantsoa.

Since all of the independent claims in the present application (and the claims dependent thereon) include limitations that are not disclosed in Rabemanantsoa, Applicant requests the withdrawal of the 35 U.S.C. 102(b) rejection based on Rabemanantsoa.

Summary of Kalyun-Seshu

Kalyun-Seshu et al is an article discussing environmental concerns as they relate to the product design cycle. A method of using assessment models with existing CAD packages is offered. The method involves outputting data from the CAD systems to external assessment tools(see pages 312 and 313). Like the previous references, there is no discussion of integrating an analysis into the CAD model as a separate feature. As previously discussed, all of the independent claims of the present invention (and the claims dependent thereon) require the integration of an analysis into a feature of a model. The Kalyun-Seshu et al reference lacks these limitations. Instead, Kalyun-Seshu et al exports data to external assessment programs.

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Applicants repeat their objection to the generalized type of rejection given by the Examiner in paragraphs 54 and 55. The Examiner has provided a summary of Kalyun-Seshu et al, a general reference to the entirety of the Abstract, and Sections I and V, and a concatenated recitation of the various limitations found in Applicants claims, but no detailed rejections indicating how in the Examiner's view each limitation is revealed by the reference. Applicants will be happy to respond with a more detailed argument in response to a more detailed rejection. Since all of the independent claims in the present application (and the claims dependent thereon) include limitations that are not disclosed in Kalyun-Seshu et al, Applicant requests the withdrawal of the 35 U.S.C. 102(b) rejection based on Kalyun-Seshu et al.

Summary of Pro/Engineer Release 19

The Pro/Engineer release 19 cited by the Examiner discusses analysis of model components. The integration of the analysis into a feature in the model which is a limitation present in each of Applicants remaining independent claims is not disclosed. The Examiner's rejection does not provide any specifics as to how the cited materials disclose the each element of the various independent claims. Since all of the independent claims in the present application (and the claims dependent thereon) include limitations that are not disclosed in Pro/Engineer Release 19, Applicant requests the withdrawal of the 35 U.S.C. 102(b) rejection based on Pro/Engineer Release 19.

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Conclusion

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Applicant believes a one month extension fee is due with this Amendment. Please charge our Deposit Account No. 12-0080, under Order No. PAS-093RCE from which the undersigned is authorized to draw for that fee and any other fees that may be due in this matter.

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Respectfully submitted

By 

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